Selection of Alternative
and
Finding of No Significant Impact

Proposed Glacial Ridge National Wildlife Refuge
Polk County, Minnesota

An Environmental Assessment (EA) has been prepared to identify and publicly disclose the possible environmental consequences that establishment of the Glacial Ridge National Wildlife Refuge, and implementation of the Interim Comprehensive Conservation Plan, could have on the quality of the physical, biological, and human environment as required by the National Environmental Policy Act of 1969 (NEPA). The EA evaluated two action alternatives for restoration and protection of a significant wetland and tallgrass prairie ecosystem in Northwestern Minnesota. The EA also evaluated the consequences of no action by the Service.

Alternative Selection: Alternative C, which includes a Core Restoration and Restoration Enhancement area containing 35,756 acres, is selected for implementation.

Justification: The Glacial Ridge National Wildlife Refuge will provide a means of preserving and restoring prairie wetland and grassland habitats for the many fish and wildlife species dependent on them. Service and partner efforts could eventually restore a landscape that includes more than 12 thousand acres of shallow and deepwater wetlands, wet prairies and natural stream watercourses. The glacial ridges and the restored tallgrass prairie uplands, would provide breeding habitats for a myriad of grassland-dependent birds. The new refuge would maintain habitat for a wide variety of birds, mammals, reptiles and amphibians--including mallard, blue-winged teal, canvasback and redhead ducks, prairie chickens, American bitterns, sandhill cranes, black terns, short-eared owls, furbearers such as mink and muskrat, red fox, moose and more than 18 species of turtles, frogs and salamanders. The restored landscape would also produce new habitat for the endangered western prairie fringed orchid, create opportunities for compatible outdoor recreation and decrease downstream flooding potential. In addition:

1. Acquisition of lands would be from willing sellers only.
2. Habitat restoration programs and efforts contributed by partner agencies and organizations are a vital part of the proposed refuge.
3. The refuge will not adversely impact drainage from neighboring lands.
4. Net impacts to the regional economy will be positive.
5. Cultural resources will be protected on acquired lands.
6. This action will not have an adverse impact on threatened or endangered species.

Finding: Based on an evaluation of the information contained in the Environmental Assessment and supporting documents, the establishment of the Glacial Ridge National Wildlife Refuge under Alternative C is not a major federal action which would significantly affect the quality of the human environment within the meaning of Section 102(2)(c) of NEPA.

Supporting Documents:

Environmental Assessment
Interim Comprehensive Conservation Plan
Land Protection Plan

Acting Regional Director

Marvin E. Moriarty

4/9/01
Date

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Chapter 1 – Purpose And Need For Action

I. Purpose

This Environmental Assessment (EA) provides the public and agency decision makers with an analysis of the range of options to restore, enhance and protect wetlands and upland habitats within a new national wildlife refuge in Polk County, Minnesota. The EA also publicly discloses the direct, indirect, and cumulative effects of each strategy on the quality of the human environment, as required by the National Environmental Policy Act of 1969 (P.L. 91-190), as amended). The Interim Comprehensive Conservation Plan found in the Appendix presents a blueprint for management practices and public recreational opportunities on the proposed Glacial Ridge National Wildlife Refuge (NWR).

Figure 1

II. Need for Action

Quality wetlands and native tallgrass prairie habitats are critical for a host of waterfowl and grassland migratory birds. These highly productive habitats should be protected or restored whenever possible. The proposed Refuge is within the prairie pothole region, an intensely agricultural area known for its historically high waterfowl production. A high percentage of the original, pre-settlement wetlands of this area have been drained over the last century. Waterfowl populations are limited in part by the loss of these wetlands. In addition, several grassland bird species are declining throughout their range. The Service is the primary federal agency responsible for conserving these species. Recent research has shown that large blocks of grasslands such as those proposed in this Refuge project may be key to reversing the downward trend.

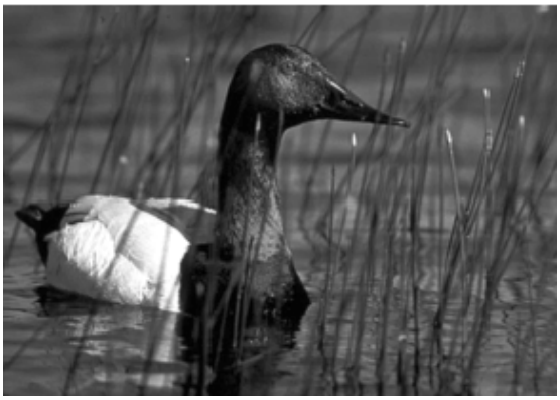
Introduction

The Glacial Ridge NWR is being proposed as a means of preserving and restoring prairie wetland and grassland habitats for the fish and wildlife species dependent on them. The study area includes parts of Tilden, Kertsonville, Grove Park, Onstad and Godfrey townships of Polk County, Minnesota. The proposed Refuge could eventually restore a landscape that includes 8,000 to 14,000 acres of shallow and deepwater wetlands, wet prairies and natural stream watercourses. The restored tallgrass prairie uplands, the glacial ridges, would provide breeding habitats for a myriad of migratory birds.

III. Background

Waterfowl and Wetlands

The majority of wetlands in the proposed Refuge area would be classified as palustrine emergent. This type of wetland has at least 30 percent emergent vegetation cover, such as cattails or rushes. Palustrine wetlands are shallow (less than 6 feet deep), and they are preferred by many species of waterfowl over deeper, open waters. Redhead, canvasback, ring-necked and ruddy ducks build nests in emergent wetland vegetation. Many more species enjoy the protection of emergent cover and the fish and invertebrate food sources which flourish in this environment.



Restored wetlands on the proposed refuge will benefit migrating and nesting waterfowl. (USFWS photo)

In Minnesota as of 1990, it was estimated that 58 percent of natural, pre-settlement wetlands remained (Dahl 1990). Nearly two out of three wetlands in western and southwestern Minnesota are privately owned, increasing their vulnerability to drainage, development and pollution (Miller and Goetzinger 1993).

Many wetlands have been drained for agricultural production. Others have been lost to housing developments, filled for highways and some have been lost to watercourse alterations and groundwater reductions.

Today, we have a new understanding of the valuable role wetlands play in ecology. Wetlands provide a host of direct benefits to humans including acting as natural filters for pollution and reducing the extent of flooding. In addition to being key habitat for migratory birds, wetlands can also serve as nurseries for a variety of fish species.

The wet meadow and open water habitats of the restored Glacial Ridge wetlands would provide feeding and nesting areas for local waterfowl such as the mallard, canvasback, redhead, blue-winged teal and gadwall. Brood production would be high based on observed current use of existing degraded habitats. Other wetland dependent birds, such as sandhill crane, great blue herons and egrets, would gain additional areas to feed and rest. Shorebirds of all kinds would use the shallow water and open meadows.

Tallgrass Prairie

Native prairie has declined 99.6 percent in Minnesota (Samson and Knopf 1994). Grassland bird species have shown steeper, more consistent, and geographically more widespread declines than any other group of North American birds (Knopf 1994). Fifty-five grassland plants or animal species in the U.S. are threatened or endangered (Samson and Knopf 1994).

The need for tallgrass prairie habitat preservation and restoration has become more critical each year as the remaining native grassland fragments are removed and by the continuing declining status of many grassland bird species throughout their range. A native prairie is an excellent example of biodiversity, with its complex web of plants,

mammals, birds, reptiles, amphibians, insects, and microscopic organisms. Native tallgrass prairie habitats in Minnesota can contain over 300 species of plants, 20 species of amphibians and reptiles, 260 species or birds and mammals and hundreds of species of insects, some so rare that only eight of some species have ever been collected. Many of our most endangered plant and animal species reside on remaining prairie fragments. In fact, the remnant prairies within the Glacial Ridge study area contain some of the largest remaining populations of the threatened Western Prairie Fringed Orchid.

Despite a broad consensus supporting the conservation of biological diversity, native prairie is largely neglected and continues to be lost (Samson and Knopf 1994). Large expanses of native prairie vegetation in private ownership have all but disappeared in western Minnesota.

Grassland Birds

The original tallgrass prairie and prairie wetland complexes of western Minnesota were important habitats for countless migratory birds. However, the State of Minnesota has lost 99 percent of its original, pre-settlement prairies, and over 40 percent of its wetlands to farming and other land use activities.

Short-eared owls will find more prey within the restored prairie habitats. (Photo by David Menke, USFWS)

To varying degrees, grassland bird species have adapted and co-existed with agriculture for most of the past century. However, grassland bird populations are steadily declining in Minnesota and other Upper Midwest states due to changes in agricultural practices, urban sprawl, introduced predators and other factors.

The following migratory bird species are listed as Resource Conservation Priorities by Region 3 of the U.S. Fish and Wildlife Service and will benefit from the proposed project: Marsh/sedge meadow species – American bittern, least bittern, mallard, blue-winged teal, trumpeter swan, black tern, upland sandpiper, sedge wren, and northern harrier; wet prairie/tallgrass prairie species – field sparrow, grasshopper sparrow, bobolink, and short-eared owl. The area is used during the migration periods by numerous shorebirds, waterfowl, sandhill cranes and tundra swans. Other birds known to use the area include Le Conte's sparrow, clay-colored sparrow, vesper sparrow, common snipe, western meadowlark and white pelican.

Farming practices have changed dramatically in the past 30 years. The grazing of the past has given way to large-scale row crop farming. The loss of hay and pasture acreage is strongly correlated with declines in grassland bird populations throughout the Midwest.

The U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service as we know it today has evolved slowly with changes in the country's use of natural resources and growing respect for the environment. Today the Service is the primary federal agency responsible for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people.

Specific responsibilities include managing the National Wildlife Refuge System, enforcing federal wildlife laws, managing migratory bird populations, restoring nationally significant fisheries, administering the Endangered Species Act, and restoring wildlife habitats such as wetlands.

> *"Working with others to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people."*
> **Mission of the U.S. Fish and Wildlife Service**

The National Wildlife Refuge System

The National Wildlife Refuge System is the world's largest and most diverse collection of lands set aside specifically for wildlife. The Refuge System began in 1903 when President Theodore Roosevelt designated 3-acre Pelican Island, a pelican and heron rookery in Florida, as a national bird sanctuary.

Today, over 530 national wildlife refuges have been established from the Arctic Ocean to the South Pacific, from Maine to the Caribbean. Varying in size from half-acre parcels to thousands of square miles, they encompass more than 92 million acres of the Nation's best wildlife habitats. The vast majority of these lands are in Alaska, with the remainder spread across the rest of the United States and several U.S. territories.

Like Pelican Island, many early wildlife refuges were created for herons, egrets, and other water birds. Other refuges were set aside for large mammals like elk and bison. But by far the most have been created to protect migratory waterfowls. This is a result of the United States' responsibilities under international treaties for migratory bird conservation and legislation such as the Migratory Bird Conservation Act of 1929.

> *"To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations.*
> **Mission of the National Wildlife Refuge System**

National wildlife refuges offer the public a wide variety of wildlife-dependent recreational and educational opportunities. Many refuges have fishing and hunting programs, visitor centers, wildlife trails, and environmental education programs. Nationwide, some 34 million visitors annually hunt, fish, observe, and photograph wildlife or participate in interpretive activities on Service national wildlife refuges.

The National Wildlife Refuge System is one of the most unique and unmatched collections of public land in the world. Many refuges are close to urban areas and almost every part of the country has a refuge nearby. Here are just a few facts that make refuges interesting and unique.

- In 1935, Red Rock Lakes NWR (Montana) was created to save the last 73 endangered trumpeter swans known in the wild. Today, 16,000 of the majestic birds are found in Alaska, Montana, and the Upper Midwest. Minnesota is reported to have over 500 resident birds.
- The Aleutian islands of Attu and Kiska in Alaska Maritime NWR were seized by Japan in World War II, the only U.S. lands controlled by a foreign power since the War of 1812.
- One of the largest U.S. swamps, the 600-square-mile Okefenokee NWR (Georgia) is also a National Wetlands Conservation Site and home to 15,000 alligators and carnivorous plants such as the hooded pitcher plant and golden trumpet.

Proposed Glacial Ridge National Wildlife Refuge

The Glacial Ridges

The demise of Glacial Lake Agassiz during the last ice age left permanent marks on the landscape. An extensive tallgrass prairie and wetland complex was created among the beach ridges left after the withdrawal of the massive lake. The marshes were sustained by the groundwater held with the beach ridge structure.

Natural forces such as floods and fire were constantly at work to maintain the balance of this ecosystem before humans exerted their interests onto the land. The water levels within the beach ridge wetlands adjusted to the seasonal deposition of rainfall and snow. The area is reported to have abounded with wildlife attracted to the tallgrass prairie, wet prairie and marshland habitats.

Native Americans were the first humans to visit the Glacial Ridge area. They undoubtedly were attracted by the migrations of bison, elk, ducks, geese and cranes during the spring and fall. Grassland species such as prairie chickens were locally abundant. With the existence of deep water lakes and hardwood forest area just several miles to the east, the area would have provided conditions for hunting, fishing, and gathering opportunities.

European immigrants first arrived in the area in the early in the 19th century. The historic Red River Trail system passed through the area. The trails were used for trade and immigrant travel between the Selkirk Settlement, near present-day Winnepeg, and St. Paul from 1820-70. An oxcart route, the Woods Trail, passed through the west end of the study area.

Early settlers in the region established farmsteads among the beach ridges. Hay was harvested from the ridge tops for livestock feed for these farms while the wetlands and fens provided water. Large-scale draining in the Tilden Township area began in 1920 with drainage of several large wetlands north of Maple Lake. Drainage continued until just a few years ago when significant funds were expended to breach several existing beach ridges in an attempt to drain out the interior waters.

Today, portions of the former beach ridge wetland complex that were converted for pasture/ hay lands are annually planted to soybeans or to wheat. A high water table and frequent springtime flooding events still place significant limits on farming success in the basin.

IV. Public Involvement

Involvement by local government officials, organizations, landowners and other interested citizens is integral to planning for any new national wildlife refuge. Proposals that involve land acquisition by a government agency can be controversial. To date this has not occurred with the Glacial Ridge proposal. Open communication with all parties is essential throughout the planning process. Starting in July 2000, the Service has provided information about the proposed project through news releases, interviews, open house events, group presentations, letters/newsletters to landowners and one-on-one discussions.

Background

A Preliminary Project Proposal for a refuge within the study area was developed by Service biologists in May 1999. The purpose of this report was to brief the Director of the U.S. Fish and Wildlife Service about the resource conservation opportunities of the area and to obtain permission to conduct a study of the merits of the proposal. The proposal was approved by the Director on May 1, 2000.

Detailed planning began in July 2000 with informal meetings and discussions with local conservation groups, government officials and some resident landowners. We also mailed a letter to all landowners in the study area explaining the start of the Refuge planning process. The letter included a postage-paid postcard for landowners to request a personal visit to discuss the project, if they desired one. The project manager made several requested visits and evening phone calls. The Nature Conservancy (TNC) announcement of the purchase of Tilden Farms, an area we were also considering for protection and restoration, prompted the Service to begin public scoping for the Refuge proposal.

Beginning with our public announcement in July 2000 and extending through January 2001, the Refuge project planning staff has placed or received over 120 telephone calls, made 21 personal visits with landowners and have given several radio interviews and group presentations related to the Refuge proposal. An initial open house event was held on July 12, 2000, at the Rydell National Wildlife Refuge to introduce the Refuge proposal. In addition, two open house events were held after release of the Draft Environmental Assessment. These events were held on January 24 and January 25, 2001, at the Rydell National Wildlife Refuge and the Crookston Public Library. The events were well attended with a total of about 70 people stopping by to discuss the proposed Refuge. People were encouraged to ask questions and fill out written comment forms at each open house.

Issues, Opportunities and Concerns

The volume of questions and concerns has been relatively light compared to other recent refuge proposals in the Midwest Region. Many written and verbal comments have been in favor of the general concept of wildlife habitat restoration in the area. The most frequent concern expressed to us has been the potential for loss of taxes resulting from lands being transferred from private to public ownership. Two landowners expressed concerns regarding the potential impacts of wetland restoration on drainage capabilities for their adjacent land.

Public Comments

The Service has received about 35 letters, comment forms, postcards and e-mail messages from people concerning the proposed Refuge. Comments were received primarily from landowners and governmental offices. Only one e-mail comment expressed opposition to the project.

Local Township Comments

The proposed Glacial Ridge NWR would encompass the majority of Tilden Township. Tilden Township has not had its own independent township board for many years because of the small resident population. Its residents joined with Park Grove Township to the east for administrative purposes. In addition, portions of three other townships could be partly included within the Refuge boundaries. Comments received from townships have dealt with taxes and a concern over the continued availability of inexpensive road gravel from the gravel pits existing on the Tilden Township lands.

Issues and concerns identified during scoping helped the Service identify and evaluate strategies for the proposed action. Individual comments expressed during the open house or received in writing have included the following themes:

Natural Resource Issues

- Loss of Wildlife Habitat
- Water Quality/Wetland Function
- Loss of Biological Diversity

Socioeconomic Issues

- Impact on Taxes
- Local Economic Impact
- Crookston water well protection

Local Land Use Issues

- Restoration of lost prairie and natural hydrology
- Additional Landowner Options for Land Conservation
- Drainage Conflicts and Drainage Districts
- Groundwater movement resulting from wetland restoration
- Landowner Rights
- Planning Process Issues
- Public Input/Review
- Gravel mining operations/gravel taxes
- Farm leases prior to restoration work

These issues will be discussed as an integral part of the Alternatives and Environmental Consequences chapters in this EA. In addition, we have included a list of frequently asked questions.

Property Taxes

Property taxes are a frequent issue whenever government acquisition of private land is proposed. Property taxes on agricultural lands vary from approximately 0.75 percent to about 2.0 percent of the market value of land in Minnesota. The actual amount levied each year varies according to the needs of local taxing jurisdictions and the property tax classification of each parcel. For example, the taxes levied on certain "homesteaded" property in Minnesota are about 0.75 percent of value, while on similar "non-homesteaded" property it may be as much as 2.0 percent of value.

Any lands acquired in fee/full title by the Service will no longer be on the local taxing jurisdictions' property tax rolls. Provisions for payment in-lieu of taxes (PILT) by a special trust and existing federal and state reimbursements are discussed in Chapter 4.

Wetland Restoration and Drainage
If restored, a minimum of 8,000 acres of the of the overall project area would be classified as "wetland" under current state and Federal wetland delineation guidelines. The vast majority of original wetlands within the beach ridge study area have been drained or subjected to attempts at drainage. Two landowners mentioned the potential impacts of large-scale wetland restoration on drainage capabilities for their adjacent land.

Opportunities for native seed revenues, tourism and hunting leases on adjacent lands were recognized as positive economic opportunities. Possible economic benefits from forage use (bison grazing) was also mentioned.

V. Decisions

This Environmental Assessment is an important step in the Service's formal decision-making process. In compliance with the National Environmental Policy Act, the Regional Director, Great Lakes-Big Rivers Region, will consider the information presented in this document to select one of the alternatives.

The Regional Director will determine whether the preferred alternative will or will not have a significant impact on the quality of the human environment and issue a Finding of No Significant Impact or a Decision of Significant Impact. A Finding of No Significant Impact (FONSI) means that the preferred alternative is accepted and can be implemented in accordance with other laws and regulations. A Decision of Significant Impact would indicate the need to complete an Environmental Impact Statement or a rejection of the project proposal.

VI. Legal Compliance

The Service planning process, land acquisition and management are done in accordance with authority delegated by Congress and as interpreted by Department of the Interior and agency regulations and guidelines. Land acquisition authority includes the Migratory Bird Conservation Act, Endangered Species Act, Emergency Wetlands Resources Act and the Fish and Wildlife Act. Land management authority, including comprehensive conservation planning, is directed primarily by the National Wildlife Refuge System Improvement Act of 1997. Other relevant Acts and Executive Orders are listed in the Appendices.

Establishing Authority

Lands acquired by the Service for the proposed Glacial Ridge NWR would be purchased under the authority of the Migratory Bird Conservation Act and the Emergency Wetland Resources Act of 1986.

Chapter 2 – Description of Alternatives

This chapter describes the range of options (alternatives) to restore, enhance and protect existing uplands, wetlands and riparian corridors within the Glacial Ridge project area. We will discuss how the alternatives were formulated, identify the preferred alternative, and explain why some alternatives were eliminated from further study.

I. Formulation of Alternatives

Each of the following alternatives was designed to benefit specific fish, wildlife and plant habitats within the study area. The boundaries were formulated based on the sub-watershed, restorable wetlands basins, the habitat requirements of desired wildlife species, public roads and comments received from the public. The recommended protection levels (fee acquisition, conservation easement, landowner incentives etc.) were based on the Service's policy to acquire the least interest in land necessary to meet refuge goals.

The proposed Refuge sits in the upper reaches of at least 10 sub-watershed basins that flow into the Sandhill River and Red Lake River watersheds. Restoration activities will have positive impacts on the water quality and quantity now being received by downstream residents. Specifically, many of the wetlands proposed for restoration were formally land-locked basins that did not historically contribute to either drainage system until the beach ridges were cut and the wetlands drained in a series of ditches.

The original proposal map displayed during the open house, in the newspapers and at other events outlined the former Tilden Farms property as the central area of focus. During development of Alternative C, the planning team decided to include additional lands for evaluation (Figure 2). The larger land area was delineated based on current land use, existing prairie remnants and the presence of restorable wetland basins that would be co-joined with the Conservancy properties. The team felt that the new alternative may better protect the sub-watersheds and facilitate the greatest opportunities for habitat restoration and water quality improvement.

The following goals are proposed for the Glacial Ridge National Wildlife Refuge:

- Strive to maintain diversity and increase abundance of waterfowl and other migratory bird species dependent on prairie wetland and grassland habitats.

- Conserve, manage, and restore the diversity and viability of native fish, wildlife and plant populations associated with tallgrass prairie and prairie wetlands.
- Work in partnership with others to restore or enhance native tallgrass prairie, prairie wetlands and unique plant communities.
- Restore, enhance, and protect water quality and quantity that approaches natural hydrologic functions.
- Provide for compatible wildlife-dependent uses by the public, emphasizing increased public understanding of the northern tallgrass prairie ecosystem and the mission of the National Wildlife Refuge System.

II. Alternatives Considered but Eliminated from Detailed Study

The following options were considered early in the planning process. The options were discussed by the planning team but were not considered to be viable alternatives.

A. Acquisition of only the Tilden Farms property. Purchase of only the former Tilden Farms parcels would significantly reduce the future possibility of creating a huge block of connected grasslands and wetlands across the northern and southern portions of the core area. Future large-scale management practices, including prescribed fire and wetland restorations, would be hampered without the ability to acquire the "inholdings" at sometime in the future from willing sellers. The boundary of such a refuge would also create significant challenges in management because of the meandering nature of the current property lines.

B. Extend the proposed Refuge boundary to County 44 on the west and County 12 on the southeast. This 45,718-acre area would include more restorable prairie (west) and existing wetlands (east). In general, the existing and restorable wetland basins in this expanded region are smaller than within the core area. The planning team decided that these additional lands could be protected and/or restored through a mix of existing federal programs and/or private conservation efforts. New conservation efforts in this area would provide a "conservation buffer" around the proposed Refuge (Alternative C). Focus would be placed on the retirement of highly erodible lands where possible and encouraging conservation practices. Any lands offered for sale would be considered for purchase within the Service's Waterfowl Production Area program.

III. Explanation Of Alternatives

Alternative A: Core Restoration

Alternative A would focus on creating a contiguous 21,750-acre block of wetland and prairie habitat primarily on the former Tilden Farms property. Acquisition of land parcels interspersed with the Tilden tracts, from willing sellers only, would be pursued as funding and opportunity permits. Acquisition of active gravel mining lease areas would not be pursued until mining activities have terminated (same under all the alternatives) or if the existing leases came for sale, and funds were available, their purchase could be explored. Under this alternative, approximately 8,112 acres of hydric soils (wetland area) would have the potential for restoration.

11 X 17 MAP INSERTED HERE

BACK SIDE OF 11 X 17 MAP

Lands bordering the proposed Refuge boundary would be eligible for participation in conservation easement programs, fee acquisition under the Waterfowl Production Area program or other private conservation measures.

Alternative B: No Action (Status Quo)

The Service would not seek to purchase land or easements for a refuge in the area. Land acquisition for waterfowl production areas could continue in the general vicinity. The Service would also continue to emphasize habitat restoration on private lands through the Partners for Fish and Wildlife Program.

Alternative C: Restoration Enhancement (Preferred Alternative)

This alternative would promote greater watershed restoration and protection with an enlarged (35,756-acre) Refuge core area (Figure 2). Under this proposal approximately 12,765 acres of wetland basins would have the potential for restoration and protection.

The Refuge boundary would be expanded in three directions. On the west side, additional TNC and Minnesota Department of Natural Resources lands that bordered the New TNC property would be included. The boundary would move south 2 miles to encompass 3,000 additional TNC (Tilden) acres to enhance Pembina trail access and several large potential wetland restoration areas to the east of State Highway 32. The boundary to the east would include more State wildlife lands, additional TNC lands, and other private holdings on the headwaters of the Burnham Creek drainage. Existing township roads were chosen for Refuge boundaries to provide easily recognizable edges to the greatest extent possible.

The land protection goal for Alternative C would be to acquire fee or permanent easements on most lands within the boundary over the course of 10 or more years. During the interim, a combination of easements, fee title or private conservation measures would be pursued based on each landowners' interest. The Service would not seek to acquire the State lands already managed for wildlife habitat.

Table 1: Summary of Issues and Opportunities Within Each Alternative

Issues/ Opportunities	Alternative A: Core Restoration	Alternative B: No Action	Alternative C: Restoration Enhancement
Local Land Use Issues			
Restoration of habitat for migratory birds and resident wildlife.	Up to 21,750 acres restored (8,100 acres of wetlands).	Up to 17,712 acres restored by TNC and government partnerships.	Up to 35,756 acres protected and restored (12,765 acres of wetlands)
Wetland function, water quality, fish habitat.	Restoration of numerous small basins and partial headwaters of Gentilly Creek. Flood control benefits and City of Crookston water wellhead protection.	Similar to Alt. A over a greater amount of time.	Restoration of headwater areas of Burnham, Gentilly, and Maple creeks. Large basin restorations to south and east.
Biological diversity	Wetland and prairie restorations would increase array of plants, birds, reptiles and invertebrates.	Similar to Alt. A.	Larger wetlands would provide more shallow water and emergent habitats.
Socioeconomic Issues			
Taxes	Would include FWS Revenue Sharing, TNC Endowment Fund and Minnesota school payments for public lands.	TNC Endowment Fund revenue.	Same as Alt. A.
Adjacent land values	None	None	Slight increase possible (value of hunting leases on adjacent land to south).
Local economy	Refuge visitors, staff salaries and construction contracts would replace reduced agriculture.	Dependent on local economic trends.	Same as Alt. A.
Local Land Use Issues			
Additional landowner options for conservation	New restoration opportunities on lands within and adjacent to proposed boundary.	Existing private lands programs.	Same as Alt. A.
Drainage and drainage ditches	Service will work with landowners and drainage districts to avoid and resolve any conflicts. Existing private drainage will not be obstructed by the Service.	Change will depend on the extent of private wetland restorations.	Same as Alt. A.
Landowner rights	No change.	No change.	No change.
Public Recreation	New public opportunities including hunting, wildlife watching and education.	Subject to allowances of private landowners.	Same as Alt. A.

Chapter 3 – The Affected Environment

I. Introduction

The study area is located on the edge of the Prairie Pothole region of northwestern Minnesota, a region known for its historic high-quality prairie wetlands and waterfowl numbers. The region includes uplands and wet basins draining to the Red Lake and Sandhill Rivers. These rivers flow into the Red River of the North and ultimately to Hudson's Bay. The site is situated at the top end of at least 10 sub-watersheds. The north side of the project is bordered by Minnesota State Highway 2. The vast majority of the wetlands in the central and western portions of the study area have been either fully or partially drained. Original wetlands still exist on the eastern portion of the area, primarily near Maple Lake. Several of these wetlands are greater than 40 acres in size.

Historically, the Core Restoration (Alternative A) portion of the study area was dominated by large wetland basins which were located between beach ridges created by historic glacial Lake Agassiz. Some of these wetlands were over 2 miles long. In addition, the landscape included many seeps (fens) and numerous wet prairie habitats.

The extensive, historic tallgrass prairie of the glacial ridge region supported large populations of free-roaming bison, elk, waterfowl and prairie chickens. Shrubs, generally snowberry and buffalo-berry, occurred along the drier sand ridge tops and were a primary food source for sharp-tailed grouse and prairie chickens. Hunters in the early 1900s reported large concentrations of these birds. Willow was also common along the edges of deepwater wetlands where they received some protection from periodic fires that visited the area.

Today, the bison and elk herds are gone and little remains of this vast prairie wetland and grassland complex. Remnant tallgrass prairies found on the western and central portions of the study area are now grazed by cattle. Aspen trees have established themselves in scattered locations as a result of the lack of fire. On the eastern edge, remnant oak savannas still dot the landscape interspersed with sites being overtaken by aspen. The beach ridges to the south of the study area also contain a mix of open pastures, croplands, existing and drained wetlands and larger blocks of aspen woodlands that have pioneered into the area over the past 60 years.

II. Geographic/Geologic Features

The study area is located in Polk County approximately 12 miles east of Crookston, Minnesota. The region is primarily flat, approximately 1,000 feet above sea level, with

low, gently rolling hills. The study area is situated on the edge of the northern tallgrass prairie between the flat Red River Valley floodplain on the west and the rolling hardwood forest and lakes region to the east.

Physiographically, the project is located in the old outwash plain of the historic Lake Agassiz. The ancient beach ridges, running northeast to southwest, are clearly visible from the air and from many locations on the ground. A glacial moraine node exists immediately to the east of the project. The resulting collection of lakes within the node created a "fire shield" on the edge of the prairie that resulted in the establishment of a maple-basswood forest community, the farthest west extension of this habitat type in the United States.

Figure 3

III. Description of Habitat

The proposed Refuge location is situated on the edge of the Prairie Pothole region of Western Minnesota between the flat Red River Valley floodplain on the west and the rolling hardwood forest and lakes' region on the east. The area contains numerous existing and drained wetland basins, fen habitat, quality and degraded (heavily grazed) northern tallgrass prairie habitat with associated areas of small scattered aspen and oak stands and farmland, much of it recently converted tallgrass prairie/pasture lands. It would be our goal to facilitate restoration of the grasslands and wetlands to as close to pre settlement conditions as practical.

The former wetlands on the east side of the study area once served as a major ground water recharge location for the prairie habitats located on the west side of the site. Concern has been expressed for the fate of the threatened Western Prairie Fringed Orchid (*Platanthera praeclara*) populations on the prairie lands as a result of all the drainage that has occurred to the east.

Historically, numerous wetlands and fens were located between the glacial ridges. Many of these have been significantly drained. The area is a mosaic of pastures, cropland, small aspen woodlots, ungrazed prairie, and numerous undrained and drained wetland basins and several gravel/sand operations.

A significant number of land parcels within the study area are enrolled in the Conservation Reserve Program (CRP) administered by the U.S. Department of Agriculture. The CRP is a voluntary program that offers annual rental payments and cost-share assistance to establish long-term resource-conserving covers on eligible land. Annual rental payments are made based on the agriculture rental value of the land. The program also provides cost-share assistance for establishing natural vegetative cover and for other

approved conservation practices. The durations of contracts are from 10 to 15 years. Current CRP enrollment in the area includes a combined total of 5,272 acres in Kertsonville, Gentilly and Onstad townships (Hillcamp, Pers. Comm.) and 7,508 acres in Tilden, Grove Park and Godfrey Townships (Reading, Pers. Comm.). In addition, about 8,000 acres are enrolled in CRP within a few miles north of Highway 2 and the study area (Balsted, Pers. Comm.).

Many acres of the tallgrass prairie pasture lands within the study area have been disturbed by heavy equipment and all glacier-strewn boulders are now bulldozed into piles for disposal. The previous landowners of Tilden Farms planned to convert more pasture to croplands. Extensive illegal drainage activities have also occurred in the proposed project area. No legal action has been taken on this case to date. Despite the extensive drainage, many former wetland sites still retain enough water to make crop production very difficult during wet years. Many farmers in this area have trouble with planting crops in wet fields and flooding losses are common.

Immediately to the east of the study area, a glacial moraine node exists. The resulting collection of lakes along the node created a “fire shield” on the edge of the prairie that resulted in the development of a maple - basswood forest community, the farthest north and west extension of this habitat type in Minnesota (Kuchler, 1964). Rydell National Wildlife Refuge is located in this forest habitat.

IV. The Current Ecological Condition

Fish and Wildlife

Mammals

The study area supports a variety of resident mammals that are locally abundant depending on the availability of food sources, loafing areas and security habitat. White-tailed deer and whitetail jackrabbits are common throughout the study area. Furbearers, including fox, coyote, long and short tailed weasels, skunk, mink, beaver and raccoons also are locally common and seen in the area on a regular basis. All of these species are very familiar to local farmers, hunters and highway motorists.

Mammals tend to be most abundant in “edge” habitats; especially those that border agricultural fields. Agricultural crops are seasonally important food sources to some of the resident mammals, especially deer. However, the availability of natural foods during winter, spring and early summer places a strict limit on local mammal populations.

Although moose crossing signs are in place along Highway 2, the local moose population has declined in recent years. Regionally, the moose population has also shown a marked decrease in size. Research is currently under way to assess the reason for the decline of moose in northwestern Minnesota. Locally, the removal of many former willow stands and the current lack of corn or sunflower fields may be a factor.

At the time of European settlement in the mid-1800s the area was home to herds of elk and bison. The tallgrass prairie dominated the landscape. Today, local residents still find bison skulls and elk antlers within the study area.

Birds

The existing beach ridge wetlands are an important stopover in spring and fall for many migratory birds. Puddle ducks – primarily mallards, some wood ducks, widgeon and blue-winged teal – and Canada geese are frequently observed where water is available. Large numbers of sandhill crane (estimates of over 20,000) also frequent the area to refuel on their journey from wintering to nesting grounds and during their return to the south. A small number currently remain in the area to nest. Large flocks of white pelicans and tundra swans are also seen in the spring when water conditions are favorable. Resident Canada geese (giant) use the open water wetlands, including the gravel pit located in the center of the study area. Concentrations of geese have been observed on the pit during the fall migration period and provide local hunting opportunities.

Greater prairie chickens and sharp-tailed grouse are residents of the study area. In 1999, at least 21 prairie chicken booming grounds were documented within the study area (Minnesota Prairie Chicken Society). Booming grounds, also know as dancing grounds or Leks, are gathering sites for male prairie chickens and sharp-tailed grouse trying to attract females during the breeding season. Use of the recorded sites ranged from three to 30 individual males.

On TNC's Pembina Trail Preserve, biologists have conducted grassland bird surveys and have documented the many species present in the area. The following migratory bird species are listed as Resource Conservation Priorities by Region 3 of the U.S. Fish and Wildlife Service, and will benefit from the proposed project: marsh/sedge meadow species – American Bittern, least bittern, mallard, blue-winged teal, trumpeter swan, black tern, upland sandpiper, sedge wren, northern harrier; wet prairie/tallgrass prairie species: field sparrow, grasshopper sparrow, bobolink, and short-eared owl.

If water conditions are favorable, the study area is also used by numerous migrating shorebirds. Additional species known to use the area include Le Cont's sparrow, clay-colored sparrow, vesper sparrow, common snipe and western meadowlark.

Fish

Three drainage systems occur within the study area. A fishery survey of the Red Lake River system documented 46 species. No current information is available on the Sandhill River system. In addition, no surveys have been conducted on the streams or lakes within the study area. Populations of gamefish, such as perch, sunfish and northern pike, are probably restricted to Bakken Lake and the scattered deepwater lakes on the southeast end of the study area. The extensive drainage that has occurred throughout the study area has left limited fish habitat. However, some small native species, such as white sucker and creek chub, can be observed in the drainage ditches and in pools near road culverts.

Reptiles and Amphibians

Streams, ditches and wetland basins provide the aquatic habitat required for a variety of turtles, frogs, toads, salamanders, and snakes. Site-specific abundance data is not available for the study area. However, at least 18 species of amphibians and reptiles have been documented at the nearby Rydell National Wildlife Refuge (USFWS 2000). These species are important food sources for many mammals, birds and fish. Their numbers and diversity are often indicators of the health of an ecosystem. Many species of reptiles and amphibians are declining on a state and nationwide basis.

Threatened and Endangered Species

One bald eagle nest has been documented on the study area. Bald eagles remain on the Federal threatened species list. One flowering plant, the Western Prairie Fringed Orchid (*Platanthera praeclara*), listed as threatened under the Endangered Species Act, has been documented at several sites in the study area. In addition, Minnesota lists nine bird species of special concern, threatened or endangered status for this region of the state.

V. Biological Diversity

Biological diversity, in simple terms, is the variety of life and its processes. This variety may occur at the genetic, species, community, and ecosystem level. Biodiversity supports the stability, integrity, and resilience of ecological systems. It provides the raw material for evolving life and the "ecosystem services" upon which we depend, such as soil building, erosion control, and hydrologic cycles. In the State of Minnesota, like elsewhere, biological diversity is declining. Loss of habitats, both physical and in function, is the greatest threat to biological diversity. The study area retains a variety of plants and animals that are comparable to other farmed beach ridge areas within northwestern Minnesota. However, a significant portion of the natural biological diversity, especially outside of the remnant tallgrass prairie areas, has been lost.

Threatened Western Prairie Fringed Orchid (Photo by Gary Muehlenhardt, USFWS)

VI. Wetlands and Riparian Zones

Remaining wetlands constitute only a small portion of the study area. The instream waters of Burnham, Badger/Maple Creek and the Gentilly River, the field drainage ditches, gravel pit ponds and a few remaining natural basins comprise the extent of permanent wetland types in the study area. Up to 12,700 acres of restorable wetlands occur in the study area.

Wetland communities are among the most biologically productive areas on earth. Wetlands also help regulate and maintain the hydrology of creeks, rivers and lakes by storing and slowly releasing waters. They maintain the quality of water by storing nutrients, decreasing sediment loads, and reducing erosion. The former wetlands of the Glacial Ridge area once provided these functions to the Red Lake and Sandhill rivers and downstream communities.

Riparian, or stream bank, zones comprise a portion of the study area. The narrow, grass ditch banks that currently exist along the former Gentilly River, Burnham Creek and the upper Badger/Maple Creek drainage would be classified as riparian habitat. These important areas serve as the transition zone between the terrestrial and aquatic environments. Stream bank vegetation contributes to channel structure, stabilizes erosive stream bank soils, shades/cools flowing water and improves fish habitats.

VII. Archaeological and Cultural Resources

Only two archeological sites have been identified on the entire land base being considered for inclusion in the proposed Refuge. Both are historic period Western culture building sites located on existing federal waterfowl production areas. The Polk County map indicates approximately 50 extant farmstead and other buildings sites. As of September 26, 2000, Polk County contains six properties on the National Register of Historic Places. All of these properties are historic period structures located in cities.

European settlement of the Glacial Ridge area was slow and sparse compared to other regions of Minnesota. During the mid-19th century the study area was part of the historic Red River oxcart trail system. The oxcart trails were used by immigrants traveling between St. Paul and the Selkirk Settlement near present day Winnepeg, Manitoba. The Woods (Pembina) Trail, a segment of the main route, traversed the west end of the study area (Minnesota Historical Society 1979).

Despite such a limited data base, the assumption must be made that undiscovered prehistoric sites are likely, especially for the Woodland culture (500 B.C. to A.D. 1650), as well as the sites of former buildings and structures. The Cheyenne tribe is the earliest historic period tribe in the area, replaced by the Ojibwa.

Chapter 4 – Environmental Consequences

I. Environmental Consequences Related to Natural Resource Concerns

Alternative A: Core Restoration

Resident Wildlife

All resident wildlife population numbers would undergo change under the core restoration. Reclamation of croplands to wetland and tallgrass prairie habitats would result in significant change in species composition and numbers. Year-round resident bird species would increase slightly. Greater prairie chickens are expected to increase substantially in the restored grassland habitats. Prairie chickens are a native species of interest to many people and currently limited in the region.

Winter resident song birds such as black-capped chickadees and common redpolls will also find additional feeding and resting areas.

White-tailed deer numbers would remain stable or increase throughout suitable habitats in the study area. The proposed Refuge would be managed as an open prairie and wetland complex with little new woodland cover and fewer cropland acres. Deer densities will be more dependent on the severity of winter weather and snow depth. Prairie and wetland restoration will create new deer feeding and resting habitat; especially along the edge of riparian willow brush and open tallgrass prairies. However, deer populations would be controlled through hunting and winter mortality within the proposed Refuge.

The fate of the regional moose population is a matter of speculation at this time. There are currently unknown problems affecting moose reproduction in northwestern Minnesota (USFWS 2000). However, habitat conditions, especially shallow wetlands and riparian woody cover, would favor their use of the study area should populations recover.

Crop depredations from deer, moose, raccoons and other species would remain at current levels or increase slightly in some locations. The acreage of croplands will be gradually reduced on the former Tilden Farms (now TNC) property. Croplands adjacent to Refuge land could incur some localized depredation. However, natural food and cover on restored Refuge lands would provide additional food sources for deer and other wildlife on a year-round basis.

Resident mammal populations, especially furbearers, will increase with the new extensive wetland habitats. Raccoon, mink, otter, beaver and muskrats would especially benefit. Higher numbers of small mammals such as mice and voles will provide an im-

proved food source for hawks, owls and other predators. Coyote, red fox, and long-tailed weasel numbers would increase along with the small mammal populations found in the grasslands.

Migratory Birds

Restored wetlands and adjacent uplands within the Glacial Ridge area would provide nesting, feeding and brood rearing habitat for waterfowl. Puddle ducks, such as mallards, blue-winged teal and northern shoveler, would nest in suitable grassland areas. Diving ducks such as canvasback, redhead, ringneck, along with several species of grebe, coots, and numerous other shorebirds, would use the wetlands as nesting habitats. A number of the wetlands may also be suitable for trumpeter swan nesting. Habitats for wading birds and grassland-dependent songbird species would increase considerably under this alternative. Species that would benefit include many listed as Resource Conservation Priorities by Region 3 of the U.S. Fish and Wildlife Service including American bittern, least bittern, black tern, upland sandpiper, sedge wren, northern harrier, field sparrow, grasshopper sparrow, bobolink, and short-eared owl.

Migrating waterfowl including Canada geese and sandhill cranes would use the area in greater numbers during spring and fall, in relation to the weather, food availability and water conditions. Crop depredations from sandhill cranes and Canada geese could increase on adjacent lands that remain in row crop production. Currently much of the adjacent land is enrolled in the CRP program and is planted to natural cover. Some depredation could occur on newly-planted fields if they are returned to production in the future.

Implementation of Alternative A could lead to the restoration of over 8,000 acres of wetland habitat. The Service's Habitat and Population Evaluation Team in Fergus Falls has estimated that these restored basins, along with the associated grasslands, would likely support 5,000 pairs of nesting dabbling ducks (Table 2). No estimates for diving duck pairs are available.

Fish

Restoration of the headwaters portions of Burnham, Badger/Maple Creek and the Gentilly River would increase the area of available habitat for native fish species now using the existing downstream habitats. Wetland basin restorations will also, in some instances, provide nursery areas for resident fish species. A restored, natural water regime will reduce water level fluctuation within the creeks and provide more reliable fish habitats.

Biological Diversity

The restoration of marsh, riparian and tallgrass prairie habitats will greatly expand the diversity and numbers of plant, bird, and insect species that currently use the study area. A number of insect species of special concern would likely find expanded habitat opportunities under all the action alternatives, thereby providing greater security for their continued existence. Native prairie grasses, such as big and little bluestem, side oats gramma and Indian grass, along with 40 to 50 forb species, would be planted in suitable areas and harvested as a local-origin seed source.

Twenty-five species of mammals are known to occupy habitats of the tallgrass prairie. Of these, the free-roaming bison, the Great Plains wolf, swift fox, pronghorn antelope and grizzly bear are no longer found in Minnesota. Black bear and elk can still be found,

Table 2: Estimated Number of Breeding Pairs of Dabbling Ducks Upon Full Restoration of Wetlands

Species	Alternative A	Alternative C
Mallard	2,401	3,111
Blue-winged Teal	2,112	2,834
Gadwall	183	223
Pintail	96	129
Northern Shoveler	229	292
Total Pairs	5,021	6,589

Source: USFWS, Habitat and Population Evaluation Team, Fergus Falls, Minnesota

however, they no longer generally occupy their prairie niche. The gray wolf (*Canis lupus*) has filled the niche vacated by the Great Plains wolf in the Aspen Parklands north of the proposed Glacial Ridge NWR, but on a limited basis. Some woodland species occur within the project area due to woodland habitat types bordering the tallgrass prairie area. Once the habitat restoration portions of the project are completed, a review could be undertaken to determine if large native species, such as bison and elk, that would not occupy the site on their own could be reintroduced into the project area.

Habitats for reptiles and amphibians will be increased. Reptiles, amphibians and insects play a pivotal role in the prairie ecosystem. At least 15 species of snakes, frogs, salamanders and turtles are found in the Minnesota portions of the northern tallgrass prairie (Hoberg, Pers. Comm.). The precise number of insect species that live in, breed in, or visit the tallgrass prairie is unknown but is estimated in the thousands. In the average prairie there are more species of invertebrates than of plants and vertebrate animals combined.

Threatened and Endangered Species

The restored wetland/prairie complex will provide habitat for expansion of the resident population of the threatened Western Prairie Fringed Orchid. In addition, the new prairies would provide habitat for 20 or more grassland-dependent songbird species.

Wetland Function

Alternative A could result in the eventual restoration of at least 8,000 acres of wetlands and wet prairie. Where possible the original meanders of the creek systems would be re-established along with their natural hydrologic function. Flood storage capacity of all the drained basins would increase and provide for a more gradual flow into the Sandhill and Red Lake rivers. Sediments carried into the river systems would also be greatly decreased with the restoration of native grasslands within the study area.

Restorations identified within this document are generally basins larger than 2 acres in size as identified from hydric soil maps (areas where wetlands once occurred). Wetland basins extending off of the project area would not be restored to their complete extent without the participation of the co-owner(s) of the basins.

Alternative B: No Action (Status Quo)

Resident Wildlife

Resident wildlife populations would continue natural trends under this alternative and respond to the land management activities of the current owners. Some of the former Tilden Farms property will see wetland and grassland restorations during the next 10 years under a joint program sponsored by TNC, Natural Resource Conservation Service, Fish and Wildlife Service, Ducks Unlimited and others. These new habitats will benefit resident birds and mammals.

Conservation Reserve Program (CRP) acres may grow slightly under the no action alternative. However, few permanent habitats for prairie chickens and other grassland birds would result from CRP or other term set-aside programs as lands are converted, enrolled and then put back into production on a rotating basis.

White-tailed deer would remain abundant throughout suitable habitats in the study area. Moose would have less cropland available but up to 8,000 acres of shallow wetlands, a natural summer food source. Crop depredations from deer, moose, raccoons and other species would likely decrease slightly depending on the timing of restorations on the former Tilden Farms and future land uses and hunting pressure.

Migratory Birds

Migrating waterfowl would continue to use the area during spring and fall in relation to existing crop and water conditions. Nesting waterfowl pairs would increase if new small wetland basins are restored under existing programs. About 7,500 acres will be enrolled in the Wetlands Reserve Program by TNC. Restoration work could begin in 2001.

Increases in CRP or Wetland Reserve Program enrollments will provide additional habitats. The resident (Giant) Canada geese will continue to use the area based on food availability and nearby open water. Crop depredations from sandhill cranes and Canada geese would likely remain at current levels. Habitats for wading birds and grassland-dependent songbird species would be limited to the existing or new grasslands, riparian corridors and small wetland areas.

Fish

No stream habitat improvement projects would result beyond Core Restoration area under the No Action alternative. Planned wetland basin restorations described earlier would provide some fish habitat. In general, the fishery would remain stable or improve slightly based on farming land use activities, ditch maintenance activities and rainfall.

Biological Diversity

Some new plant, bird or mammal species will move into the Core Restoration area as the result of TNC land conversion. However, broadscale increases in diversity will require substantial changes in existing land uses. A few species may pioneer the area as a part of a natural range expansion. Rare plant species, primarily in existing prairie fragment areas on the edges of the study area, may lose habitat to gravel quarries. A slight increase in overall biological diversity would be expected under the No Action alternative over time.

Threatened and Endangered Species

The majority of the existing Western Prairie Fringed Orchid populations are found on TNC lands and will be protected. However, future land uses such as gravel mining and herbicide applications on private lands within the peripheral study area may impact a few orchid sites.

Wetland Function

Possibly 4,000-8,000 acres of marsh or wet prairies would be restored in the Core area as the result of Wetland Reserve Program. A few small wetland basins elsewhere could be restored under existing partnership programs or through private efforts. Drainage and row crop farming within most of the study area would continue depending on the future agricultural economy. The ability of the area to retain flood waters would increase or remain at the current level. Portions of the current drainage ditch system would need to be maintained to facilitate flow off neighboring agricultural lands. The possibility of large basin wetland restorations would be reduced by the No Action alternative.

Alternative C: Restoration Enhancement (Preferred Alternative)

Resident Wildlife

Habitat benefits for resident wildlife will be similar to Alternative A with the added value of 4,000 more acres of restorable wetlands. Some additional areas within Alternative C are grazed native tallgrass prairies. These existing habitats could easily be enhanced through active management and offer greater security for grassland nesting birds such as prairie chickens and other wildlife.

Migratory Birds

Alternative C would result in the protection of more existing deepwater wetlands. These lakes and ponds would supplement the habitat needs of diving waterfowl species such as canvasbacks. The increase restoration of wetland habitats and upland nesting areas would encourage a higher number of grassland and wetland nesting species including mallard, shoveler, blue-winged teal, Wilsons snipe, yellow and sora rail, bobolink, meadowlark (both eastern and western), and savannah, grasshopper, LeConte's, sharp-tailed, vesper and clay-colored sparrows.

Fish

The additional protection of headwaters and downstream portions of three creek systems within Alternative C will ensure higher water quality for fish and their invertebrate food source in the restored riparian and wetland systems. Water level fluctuations within the creek systems will also be reduced.

Biological Diversity

Overall diversity would be similar to Alternative A. Larger restored grassland blocks and wetland basins may supply habitat or support genetic viability for a few additional plant and animal species.

Table 3: Summary of Possible Natural Resource-related Environmental Consequences

	Alternative A	Alternative B	Alternative C
Resident Wildlife	Significant increase in resident mammals and prairie chicken populations. Crop depredation could increase slightly.	Stable to increasing. Planned TNC restorations will increase wildlife habitat. Crop depredations at current levels.	Increase over Alt. A. Up to 4,500 more wetland acres. Possible slight increase in crop depredation.
Migratory Birds	Increased. New wetland habitat for migrating and nesting ducks, geese and cranes. Increase in grassland bird habitat.	Stable to increased. Use will depend on condition of wetlands and nesting habitats.	Increase over Alt. A. More edge/ riparian species due to increases in wetlands. Marked increase in waterfowl and grassland birds.
Fish	Increased. Restored wetlands and riparian habitats will increase fish habitats.	Stable to increased. Land use changes (retirement) would improve water quality.	Increased over Alt. A. Up to 4,500 more wetland acres will bring additional quality riparian habitats.
Biological Diversity	Increased. Wetland and prairie restorations will greatly increase array of plants, birds, reptiles and invertebrates.	Similar to Alt. A. Fewer restored acres under private efforts.	Increased over Alt. A. Larger wetlands would provide more wet prairies and fens.
Wetland Function	Increased. Restoration of up to 8,112 acres of wetlands. Enhanced flood control and water quality. Adjacent prairie restoration would enhance wetland values.	Increased. Restorations under Wetland Reserve Program (7,500 acres scheduled).	Increased over Alt. A. Possible restoration of 12,765 acres of wetlands.
Threatened and Endangered Species	Increased. New or protected existing habitats for the threatened Western Prairie Fringed Orchid.	Increased. TNC will protect populations on their newly acquired lands.	Increased over Alt. A.

Threatened and Endangered Species

The addition of grassland habitats to the northwest and southwest will substantially increase the restoration and protection potential for the threatened Western Prairie Fringed Orchid.

Wetland Function

Similar to Alternative A except the expanded Restoration Enhancement area could result in an additional 4,000 acres of restored wetlands. Some the large wetland basins on the southern portion of the study area would be more than 4 miles long without a road crossing. The increase in restored wetland acres will also enhance the value of each beach ridge basin area; especially to retain snow and rain events.

II. Environmental Consequences Related to the Socioeconomic Environment

This section examines potential effects on tax revenue and the local economy that may result from the acquisition, operation and maintenance of a national wildlife refuge in the study area. Each of the alternatives, except no action, includes land acquisition and the need for future Refuge administration. For this reason, we address all alternatives together within this section. Alternative B, No Action implies, with a few noted exceptions, that the local economy and taxes will follow current trends.

During the public scoping for this Refuge proposal, a few people, including a local county official, expressed concern over the possible impacts of Refuge establishment on local tax revenues. They also mentioned the impact on local gravel mining operations; specifically a loss in gravel taxes and availability of gravel for the local townships. In their opinion, the Service policy of making revenue sharing payments in lieu of taxes was not enough to offset the current tax income.

Taxes

The Nature Conservancy purchased a major portion (24,000 acres) of the Refuge study area in August 2000. The Nature Conservancy has announced its intent to create a fund to cover taxes on these acquired lands in perpetuity. The fund would remain in existence even if a Refuge were established and included former TNC lands.

The Nature Conservancy also plans to sell the former Tilden Farms grain cleaning facility to a private party. The new owners of this facility would continue to pay taxes. Long-term gravel leases have been negotiated with the current operators. Tax revenue from existing gravel removal operations should continue for many years.

The Service has reviewed current gravel mining operations in the study area. We have determined it would not be a priority to purchase active gravel operations unless all gravel rights could also be acquired at the same time. Also, any active gravel pits sought for acquisition should not be a sole source of gravel in the area.

The Service will make Revenue Sharing Payments (payments in lieu of taxes) at 0.75 percent of the **appraised** land value; not the value assessed by local governments. In

general, the amount of tax revenue generated from Glacial Ridge lands under public ownership will be about the same as "homesteaded" taxes or about half of "non-homesteaded" taxes. The actual amount levied each year varies according to the needs of local taxing jurisdictions and the property tax classification of each parcel. For example, the taxes levied on certain "homesteaded" property in Minnesota are about 0.75 percent of value, while on similar "non homesteaded" property it may be as much as 2.0 percent of value. A significant portion of the former Tilden Farms ownership was taxed at the non-homestead level.

Land acquisition under both action alternatives would likely occur over 20 years or more. The extent of fee ownership by the Service is difficult to predict as it depends on the landowner's desire to sell land and whether buildings are included. It is also difficult to predict future tax assessments over such a long term. However, under Alternative A, the combination of Refuge Revenue Sharing, TNC fund and the state school tax reimbursement programs for public lands should provide a tax revenue package equal to current revenue.

Alternative C could result in a small shortfall in tax revenue if all non-TNC lands within the proposed boundary were acquired in a short period of time. This quick, total acquisition scenario is very unlikely based on our experience with similar refuge projects within the Midwest. The rough shortfall estimate of $25,000 to $32,000 represents 0.30 percent (.003) of the $10 million Polk County property tax levy for 1999. In addition, the conversion of existing agricultural lands to native wetlands and prairie will require little or no new local government services. For example, the tax burden for road construction or repair will be reduced by the presence of a wildlife refuge and could likely eliminate any future tax shortfall.

A gravel mining operation within the study area. (Photo by Rick Julian, USFWS)

The Local Economy

The local economy can experience some changes during the formation of a new national wildlife refuge. In general, the proposed Glacial Ridge NWR would likely create increased spending in the area by visitors to the Refuge, reduced agricultural production comparable to the Conservation Reserve Program, and increased expenditures by the Service to build and maintain Refuge facilities. In addition, the new Refuge could ultimately require an administrative facility and staff. Comparable refuge operations elsewhere in Minnesota have an annual station budget of more than $700,000.

The Refuge would likely be developed over the course of 20 years or more. During that time, funds would be needed for engineering and construction of facilities. Several hundred thousand dollars will be expended returning the lands to a native prairie complex of wetland and grasslands. This money will be expended locally for items such as native grass seed, fuel and contracts with heavy equipment operators for wetland restorations.

The Service estimates that federal purchases of land or conservation easements in the area under the preferred Alternative C could amount to more than $7 million during the next 20 years. Economists generally view land transactions as having a neutral effect in a local economy. They suggest that proceeds of a land sale generally go back into real estate. However, it is reasonable to assume that some portion of the land acquisition dollars will be used by sellers to construct new homes, purchase new vehicles, etc.

The proposed Glacial Ridge National Wildlife Refuge, as envisioned, could actually draw people into the local communities, generating income for tourist-oriented businesses and services. *Banking on Nature*, the Service's study of the economic benefits of refuges, found that nationally visitors contribute more than $400 million every year to local economies. The publication reports that in 1995, non-resident funds generated at Crab Orchard National Wildlife Refuge in southern Illinois totaled $3.29 million in the Marion, Ill., region and 76 additional jobs were created. Non-resident refuge visitors spent about $1.8 million in the Horicon National Wildlife Refuge area in central Wisconsin in 1995. The proposed Glacial Ridge National Wildlife Refuge is more remote than many of the refuges examined in the *Banking on Nature* study. However, national wildlife refuges in general are recognized by wildlife recreationists, including hunters and bird watchers, as desirable destinations and many go out of their way to visit. Such non-resident and regional visitors to the Glacial Ridge National Wildlife Refuge will contribute a positive level of spending to the local economy.

In summary, the proposed Glacial Ridge National Wildlife Refuge would likely have a small *net* effect on county-level economic activity and could generate considerable social benefits. The value of natural areas, such as wildlife refuges, to people and their quality of life is difficult to measure in conventional economic terms. National wildlife refuges enhance the regional, state and the nation's stock of natural assets and provide important, but less tangible, benefits to its citizens, including clean water, natural beauty and abundant wildlife, fish and plants. Nevertheless, the Service recognizes that potential changes in the local and regional economy are important considerations.

III. Environmental Consequences Related to Local Land Use including Land Acquisition, Cultural Resources, Refuge Management and Administration

This section examines potential effects on landowners and local residents that may result from the acquisition, operation and maintenance of a national wildlife refuge in the study area. Each of the alternatives, except no action, includes land acquisition and the need for future refuge administration. For this reason, we address all alternatives together within this section. More detail can be found on these topics in Appendix A, the Interim Comprehensive Conservation Plan (ICCP). The ICCP provides general guidelines for the future management and administration of the proposed Refuge.

Landowner Rights Adjacent to Refuge Lands

If a refuge is established, the Service has no more authority over private land within or adjacent to the boundaries of the Refuge than another other landowner. Landowners within a project boundary retain all of the rights, privileges, and responsibilities of

private land ownership. The presence of refuge lands does not afford the Service **any** authority to impose restrictions on any private lands. Control of access, land use practices, water management practices, hunting, fishing, and any other general use is limited to those lands in which the Service has acquired an appropriate real estate interest or rights.

Owning land adjacent to Service land does not change any of the regulations that currently apply and does not impose any new regulations on the land. Regulations pertaining to pesticides, drainage, pollution, hunting, fishing, trapping, etc., on private land are managed and enforced by other local, state or Federal agencies. The Service abides by these regulations the same as any other landowner. In addition, land managed by the Service will be posted in order to avoid trespass on private land by Refuge visitors.

Service Land Acquisition Policies

Service policy is to buy land only from willing sellers. No land or rights to land would be acquired without the willing participation of the individual(s) owning land or rights to the land, including appropriate just-compensation for those rights. The Service is required to make purchase offers based on fair market value; matching the price of comparable land in the same area.

It is also Service policy to seek the least amount of land ownership necessary to meet resource protection goals. Alternative A would include primarily land acquisition. Alternative C includes voluntary land protection, stewardship and other private conservation measures as options for landowners. Fee acquisition is only one part of the preferred alternative for the proposed Glacial Ridge NWR. If a landowner chooses to sell land or enter into a conservation easement with the Service, and funding is available, the Refuge Manager and/or a Realty Specialist will fully explain the procedure and time frames.

Revenue Sharing Payments

The Refuge Revenue Sharing Act of June 15, 1935, as amended, provides for annual payments to counties or the lowest unit of government that collects and distributes taxes based on acreage and value of national wildlife refuge lands located within the county. The funding for these payments comes from two sources: (1) net receipts from the sale of products from National Wildlife Refuge System lands (oil and gas leases, timber sales, grazing fees, etc.) and (2) annual Congressional appropriations.

Originally, counties received 25 percent of net revenues from the sale of various products or privileges from refuge lands located within the county. The result was that many counties received no payments as no revenue was generated from local refuge lands. The Refuge Revenue Sharing Act was amended in 1964 to provide for a payment of the greater of 25 percent of net receipts, $0.75 per acre or three-quarters of 1 percent of the adjusted purchase price for all purchased land. In the state of Minnesota, three-quarters of 1 percent of the appraised value always brings the greatest return to the taxing bodies (townships and counties).

The Refuge Revenue Sharing Act was again amended in 1978 by Public Law 95-469. Important changes are: (1) Congress is authorized to appropriate funds to make up any shortfall in the revenue sharing fund; (2) all lands administered solely or primarily by the

FWS (not just refuges) qualify for revenue sharing; and (3) payments to units of local government can be used for any governmental purpose.

The amount of a revenue sharing payment is directly tied to the **appraised** market value of a property. In some cases, annual payments to local governments exceed what the local tax, based on assessed value, would have been if the land was still in private ownership. In other cases, revenue sharing payments, and supplemental Congressional appropriations, fall short of the local assessed property tax revenue. Some members of Congress have recognized this fact and have taken steps to remedy the situation. H.R. 701, the Conservation and Reinvestment Act (CARA), and a companion Senate bill, were introduced in March 1999. These bills contained a provision for full funding of the Refuge Revenue Sharing Act. The proposed source of funds would be federal offshore oil and gas lease revenues. However, despite passage in the House of Representatives, CARA did not get scheduled for a vote in the U.S. Senate during 2000 and the bill will need to be reintroduced in the 107th Congress.

Relocation Policies

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act) provides for certain relocation benefits to home owners, businesses, and farm operators who are displaced as a result of Federal acquisition. The law provides for benefits to eligible owners and tenants in the following areas:

- Reimbursement of reasonable moving and related expenses;
- Replacement housing payments under certain conditions;
- Relocation assistance services to help locate replacement housing, farm, or business properties;
- Reimbursement of certain necessary and reasonable expenses incurred in selling real property to the government.

Cultural Resources

Refuge establishment and subsequent land acquisition generally will have no effect on archeological resources. Traditional cultural properties and sacred sites of concern to Indian tribes and other ethnic and cultural groups receive increased protection to the extent the FWS can obtain information about them. However, in some cases buildings and other structures may not receive increased attention under Service versus private ownership. The high cost of maintaining and preserving some buildings may prohibit acquisition or future use of some building sites. But overall, cultural resources receive increased protection from loss because of the several Federal laws that apply to property owned and administered by the Federal government.

The Service might affect some cultural resources when it develops Refuge land for wildlife habitat, administrative facilities or public use areas.

The potential for Refuge activities to affect prehistoric and historic resources, Native American human remains and cultural objects, and traditional and sacred sites will be determined early in project planning. The Refuge manager, with the assistance of the Regional Historic Preservation Officer, will develop a program for conducting inventory surveys and attempt to obtain funding for those surveys. The requirements of the several

cultural resources laws, executive orders, Federal regulations, policies and standards specified in the Fish and Wildlife Service Manual 614 FW 1-5 apply in all cases.

Archeological investigations and collecting are performed only in the public interest by qualified archeologists working under an Archaeological Resources Protection Act or Antiquities Act permit issued by the Regional Director. Refuge personnel take steps to prevent unauthorized collecting by the public, contractors, and refuge personnel. Violations are reported to the Regional Historic Preservation Officer.

Effects on Current Drainage Patterns

The Service would not cause any artificial increase of the natural level, width, or flow of waters without ensuring that the impact would be limited to lands in which the Service has acquired an appropriate real estate interest from a willing seller, e.g., fee title ownership, flowage easement or cooperative agreement. Thus, all alternatives would not have any impact on drainage from neighboring lands. If Service activities inadvertently created a water-related problem for any private landowner (flooding, soil saturation or deleterious increases in water table height, etc.), the problem would be corrected at the Service's expense.

Refuge Administration

Any acquired lands would become part of the National Wildlife Refuge System. In beginning stages a new refuge could be managed administratively as a satellite refuge by the Rydell NWR at Erskine. As the land base increases, the complexity of habitat management and administration increases, and the new refuge would probably be assigned its own funding, equipment, and staff. Speaking very generally, a fully staffed refuge of this size would have about seven staff members and an annual operating budget of approximately $700,000. Please see Appendix A for more details about potential future Refuge management.

Impact on Public Roads

The Service does not close roads without township and county approval. Generally, closures are sought only if a road is landlocked by Service property and is a dead end. The current road system would remain the same unless access requires modification sometime in the future. Coordination with state, county, and township officials and residents would be required for any road closure.

Public Recreational Use

The opportunity for wildlife-dependent public recreational use will increase under alternatives A and C. The Refuge Improvement Act of 1997 identifies six priority uses as wildlife-dependent recreational activities: hunting, fishing, wildlife observation, photography, environmental education, and interpretation. These uses are encouraged on refuges when they are compatible with the purposes of the refuge. A pre-acquisition Compatibility Determination has been included with Appendix A. This certificate states which of the six priority public uses currently occurs within the project area and which uses will be allowed until a Comprehensive Conservation Plan is prepared for the new Refuge. Currently, we anticipate that all six priority uses will be allowed as soon as a sufficient land base is acquired for the Refuge.

Public recreational use is permitted on nearly all national wildlife refuges. There are 46 national wildlife refuges in the Great Lakes-Big Rivers Region of the U.S. Fish and Wildlife Service, which includes Wisconsin, Minnesota, Iowa, Illinois, Indiana, Michigan, Ohio and Missouri.

Of these, 39 are open to various public uses. The seven that are not open include two caves with endangered species and five islands used by colonial nesting birds.

IV. Cumulative Impacts

The phrase "cumulative impacts" refers to the overall effect of the proposed action or a series of similar actions in a landscape or regional setting. Restoring natural wildlife habitat, as proposed in all three alternatives, is generally considered to have positive environmental consequences. Native prairie plant communities, waterfowl, and grassland bird populations will all benefit on a regional basis. The restoration of lost or degraded wetlands in particular will have an overall positive impact on the surrounding region and the human environment. For example, alternatives A, B and C will all result in an increase in water retention in the upper watershed of several Red River drainages. Flood control benefits to downstream communities, and protection of the existing water supply for the City of Crookston, will result from the restored natural hydrology.

V. Environmental Justice

Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was signed by President Bill Clinton on February 11, 1994, to focus Federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed Federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in Federal programs substantially affecting human health and the environment, and to provide minority and low-income communities access to public information and participation in matters relating to human health or the environment.

In 1997, U.S. Census Bureau figures showed that 14 percent of the population of Polk County lived below the poverty level. In 1990, the population of Polk County was 31,501. Slightly fewer than 1,000 people (3 percent) were reported as a racial minority.

The minority population is small in Polk County and the poverty rate is low. Based upon the U.S. Census Bureau figures, it is apparent that the proposed Refuge does not disproportionately place any adverse environmental, economic, social, or health impacts resulting from this proposal on minority and low-income populations.

Chapter V. List of Preparers

Rick Julian
Refuge Manager
Rydell NWR, Erskine, Minn.
Environmental Assessment co-author

Gary Muehlenhardt
Wildlife Biologist
Regional Office, Fort Snelling, Minn.
Environmental Assessment co-author

John Dobrovolny
Regional Historian
Regional Office, Fort Snelling, Minn.

Sean Killen
Cartographer
Regional Office, Fort Snelling, Minn.

Tom Worthington
Chief, Visitor Information Management
Regional Office, Fort Snelling, Minn.

Jane Hodgins
Technical Writer/Editor
Regional Office, Fort Snelling, Minn.

Chapter VI. Consultation and Coordination With the Public and Others

Preparation of this EA included many contacts and discussions with local residents, elected officials, State employees and others. Public involvement, including review of the Draft EA, is key to a full evaluation of this project. A description of public scoping and participation in the process so far can be found in Chapter 2.

This EA will be distributed to everyone who attended the open house events, appropriate local and state governments, local public libraries, as well as to interested organizations. The entire EA is available on the Service Internet Web site for the Glacial Ridge National Wildlife Refuge project (http://midwest.fws.gov/planning/glacialtop.htm). We will also send a summary and/or notice of availability to everyone on our mailing list. This list includes all landowners within the study area. A 30-day public review period and two local open house events followed release of the Draft EA. During this time, people were encouraged to ask questions and provide written comment forms.

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